

LOGSHEET FOR FIELD CHANGES TO CONTROLLED DOCUMENTS

Change Number	Date	Document Number	Document Title	Section/Page Modified	Description Of Change(s)	Responsible Manager Approval	ESH&Q Approval	Radiological Engineering Approval	Quality Assurance Approval	Completion Of ADM 2.01 Checklist	Completion Of SES/USQD Checklist
3	6-23-98	RE/RMRS-97-010	Final Site Specific Health and Safety Plan for the Source Removal at Trench 1 IHSS 108	Section 7.3 Page 68 Table 7.1	Revised personal protective clothing to be worn on body and foot in the High Contamination Area Within the Temporary Structure to reflect the use of a single set of Anti-C coveralls.	WLS	6/24/98	WLS	WLS 6/24/98	N/A 7/2	N/A 7/2
3	6-23-98	RE/RMRS-97-010		Section 7.4 Page 78 Table 7.2	In the Radiological Suspension Guide Limits, revised Beta/Gamma radiation in the "HCA" or "CA" beta SGL to 1000 mrad/hr beta on contact.	WLS	6/24/98	WLS	WLS 6/24/98		
3	6-23-98	RE/RMRS-97-010		Section 7.4 Page 79 Table 7.2	In the Radiological Administrative Limits, added a new row with the following: Hazard: "Presence of Pu in Waste per gamma spec analysis" Action Level: "Pu + Am ²⁴¹ activity in excess of 2% of total U activity" Actions to be Taken: "Notify Radiological Engineering" Monitoring/Sampling Frequency: "Per RMRS and Sharnet SAPs"	WLS	6/24/98	WLS	WLS 6/24/98		
3	6-23-98	RE/RMRS-97-010	Final Site Specific Health and Safety Plan for the Source Removal at Trench 1 IHSS 108	Section 7.7.1 Page 97	Deleted the need to relocate to and stay at a safe upwind assembly area when Radiological Air Sample Results are > RWP Suspension Guide Limits in the Temporary Structure	WLS	6/24/98	WLS	WLS 6/24/98		
3	6-23-98	RE/RMRS-97-010		Section 7.7.3 Page 99	Deleted the need to relocate to and stay at a safe upwind assembly area when Equipment Radiological Contamination or Radiation Levels are > RWP Suspension Limits	WLS	6/24/98	WLS	WLS 6/24/98		
3	6-23-98	RE/RMRS-97-010		Section 7.7.4 Page 100	Deleted the need to relocate to and stay at a safe upwind assembly area when Personnel Radiological Contamination is detected	WLS	6/24/98	WLS	WLS 6/24/98		
3	6-23-98	RE/RMRS-97-010		Section 7.7.6 Page 101	Revised second and forth bullets to read that personnel need to relocate to a "safe area" rather than a "safe upwind assembly area"	WLS	6/24/98	WLS	WLS 6/24/98	N	✓

Change Number	Date	Document Number	Document Title	Section/Page Modified	Description Of Change(s)	Responsible Manager Approval	ES&Q Approval	Radiological Engineering Approval	Quality Assurance Approval	Completion Of ADM 2.01 Checklist	Completion Of SES/USQD Checklist
3	6-23-98	RF/RMRS-97-010		Section 7.7.7 Page 102	Clarified that real time air monitoring results need to be sustained (approximately ten seconds) and in the breathing zone. Also deleted the need to relocate to a safe upwind assembly area	<i>[Signature]</i>	<i>[Signature]</i> 6-24-98	<i>[Signature]</i>	DS 6/24/98	NA <i>[Signature]</i>	NA <i>[Signature]</i>
3	6-23-98	RF/RMRS-97-010		Section 7.7.11 Page 104	Deleted the need to relocate to and stay at a safe upwind assembly area when Encountering Unusual Debris During Excavation	<i>[Signature]</i>	<i>[Signature]</i> 6-24-98	<i>[Signature]</i>	DS 6/24/98	<i>[Signature]</i>	<i>[Signature]</i>
3	6-23-98	RF/RMRS-97-010		Section 7.7.13 Page 105	Revised criteria which constitutes a compressor failure and would require suspension of work.	<i>[Signature]</i>	<i>[Signature]</i> 6-24-98	<i>[Signature]</i>	DS 6/24/98	<i>[Signature]</i>	<i>[Signature]</i>

* Affixed signatures indicate that Operations Review Committee (ORC) and/or Independent Safety Reviews are NOT applicable because Scope and Fundamental Technical Specifications were NOT changed. Also, related documents affected by the change(s) were modified accordingly.

Table 7.1

¹ If splash hazards exists and cannot be mitigated, polycoated Anti-Cs or polycoated long sleeve aprons will be worn. Arm sleeves and aprons will be worn by selected individuals at the discretion of the Radiological Safety Technical Supervisor.

² No eye protection will be required when a full facepiece respirator is worn.

³ Work may be conducted in Level C respiratory protection if continuous real-time air monitoring indicates no action levels are exceeded and no excavation is being conducted.

² No eye protection will be required when a full facepiece respirator is worn.

³ Depending on the results of chemical and particulate air monitoring, SCBA or supplied air respiratory protection may be required. No respirators required when personnel or equipment are not exiting the High Contamination Area and the Continuous Air Monitors (CAMs) are operational.

Table 7.2
 Monitoring Program Summary

RADIOLOGICAL SUSPENSION GUIDE LIMITS			
Hazard	Suspension Guide Limit/Hold Point	Action(s) to be Taken	Monitoring/Sampling Frequency
Equipment or material radiological contamination in "HCA"	Alpha contamination: 200,000 dpm/100cm ² removable Beta/gamma contamination: 400,000 dpm/100cm ² removable	Suspend operations, secure area and notify the Field Supervisor and Radiological Safety Technical Supervisor (RSTS)	Daily contamination control surveys within the "High Contamination Area".
Equipment and material radiological contamination in "CA"	Alpha contamination: 50,000 dpm/100cm ² removable 500,000 dpm/100cm ² total Beta/gamma contamination: 100,000 dpm/100cm ² removable 500,000 dpm/100cm ² total ¹	Suspend operations, secure area and notify the Field Supervisor and RSTS.	Daily contamination control surveys within the "Contamination Area".
Equipment and material radiological contamination in "RBA" or areas not controlled for radiological purposes	Alpha contamination: 1,000 dpm/100cm ² removable 5,000 dpm/100cm ² total Beta/gamma contamination: 1,000 dpm/100cm ² removable 5,000 dpm/100cm ² total ¹	Suspend operations, secure area and notify the Field Supervisor and RSTS.	Daily contamination control surveys within the "Radiological Buffer Area".
Personnel contamination.	> MDC ² of instrument	Notify the Field Supervisor and RSTS.	Prior to exiting a "Contamination Area"
Airborne radioactivity	10 DAC ³ (U ²³⁸ Class Y) when supplied air or full-facepiece air-purifying respirators are worn 0.10 DAC (U ²³⁸ Class Y) when no respiratory is worn	Remove personnel from effected area, suspend operations, secure area and notify the Field Supervisor and RSTS.	Per the Radiological Work Permit and the ALARA Job Review
Beta/Gamma radiation in "HCA" or "CA"	10 mrad/hr gamma at 30 centimeters	Suspend operations, secure area and notify the Field Supervisor and RSTS. Performed neutron survey if > 10 mrad/hr gamma at 30 centimeters	Shiftily to characterize excavated material, waste packages, and work areas
	1000 mrad/hr beta on contact		
Presence of total Pu or U ²³⁵ as determined by gamma/alpha spec analysis	15 grams fissile U per pkgd container 3,960 grams enriched U per pkgd container 100 nCi/g Pu concentration 1 gram total Pu (WG Pu) per pkgd container	Suspend operations, secure area and notify Nuclear Safety and Criticality Safety.	Per the RMRS and Starmet SAPs

¹ Due to beta/gamma radiation penetrating the walls of waste packages, these limits for direct total beta/gamma may not be applicable.

² MDC - Minimum Detectable Counts

³ DAC - Derived Air Concentration

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Table 7.2
 Monitoring Program Summary (cont.)

RADIOLOGICAL ADMINISTRATIVE LIMITS			
Hazard	Action Level	Action(s) to be Taken	Monitoring/Sampling Frequency
Releasing equipment or material from the "HCA" to the "CA" with contamination above "CA" limits	Alpha contamination: 50,000 dpm/100cm ² removable 500,000 dpm/100cm ² total. Beta/gamma contamination: 100,000 dpm/100cm ² removable 500,000 dpm/100cm ² total ¹	Equipment or material may not exit "High Contamination Area". Decontaminate or dispose of as waste	Prior to removal of equipment or material from the "HCA" to a "CA"
Releasing equipment or material from a "CA" with contamination above unrestricted release limits	Alpha contamination: 1,000 dpm/100cm ² removable 5,000 dpm/100cm ² total Beta/gamma contamination: 1,000 dpm/100cm ² removable 5,000 dpm/100cm ² total ¹	Equipment or material may not exit "Contamination Area". Decontaminate or dispose of as waste.	Prior to removal of equipment or material from a "Contamination Area" to an area not controlled for radiological purposes
Suspected presence of Pu ²³⁹ or U ²³⁵ as determined by Electra alpha/beta ratios	Alpha/Beta ratio > 1:2	Notify the Field Supervisor and RSTS. Contain material if possible. Analyze with AP-2. If AP-2 is inconclusive, conduct analysis by gamma/alpha spectroscopy.	Daily contamination control surveys
Airborne radioactivity	> 0.10 DAC (U ²³⁸ Class Y)	Notify the Field Supervisor and RSTS. Post area as "Airborne Radioactivity Area"	Per the Radiological Work Permit and the ALARA Job Review
Gamma radiation in "HCA" or "CA"	> 2 mrad/hr general area dose rate	Notify the Field Supervisor and RSTS. Locate and if possible control the source.	Shiftly to characterize excavated material, waste packages, and work areas
	> 5 mrad/hr at 30 centimeters	Notify the Field Supervisor and RSTS. Post area as a "Radiation Area"	
Gamma radiation at "RBA" boundary	> 50 μ rem/hr	Notify the Field Supervisor and RSTS. Adjust boundary until levels are < 50 μ rem/hr	Weekly or as required to characterize the "RBA" boundary
Presence of Pu in waste per gamma spec analysis	Pu + Am ²⁴¹ activity in excess of 2% of total U activity	Notify the Field Supervisor, the RSTS, and Radiological Engineering	Per the RMRS and Starmet SAPs
Presence of Pu ²³⁹ in soil as determined by gamma/alpha spec analysis	$\geq 8,475$ pCi/g in any soil sample	Notify Air Quality Management	Per the RMRS and Starmet SAPs

¹ Due to beta/gamma radiation penetrating the walls of waste packages, these limits for direct total beta/gamma may not be applicable.

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and whether the controls on the project are sufficient to address the hazard or condition. Based on this initial evaluation, a determination will be made whether to proceed with controls currently in place; segregate the hazard or condition from the project activity, if it can be done safely; or curtail operations to address the unexpected hazard or condition. Concurrence to proceed down the selected path must be obtained from the RMRS Environmental Restoration Director or designee. In addition, the resumption of field activities involving radiological issues will be in accordance with Article 345 of the RFETS Radiological Control Manual."

Note: "Unanticipated Hazards or Conditions" do not replace conditions which require emergency response, rather, they ensure that all work is performed based on an informed approach in regards to all known or potential hazards.

The following sections list possible "Unanticipated Hazards or Conditions" and the corresponding response action.

7.7.1 Radiological Air Sample Result > RWP Suspension Guide Limits in the Temporary Structure

In order to protect workers within the temporary structure and to prevent the spread of contamination to the outside environment, high and low volume radiological air samples will be obtained inside the temporary structure.

If elevated readings are obtained during the initial counting of a high or low volume radiological air sample, the sample will be evaluated to determine if the elevated reading is due to naturally occurring radioactive material or Uranium²³⁸. Evaluation methods may include radon decay tracking, SAIC, Model AP-2 portable alpha analyzer analysis, gamma/alpha spectroscopy analysis, or other analysis as determined by Radiological Safety Technical Supervisor. If an air sample result is confirmed to be greater than the RWP suspension limit for Uranium²³⁸, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
- RCT's not wearing respiratory protection in the RBA/CRZ will immediately exit the temporary structure;
- the Radiological Safety Technical Supervisor will be notified;
- all nonessential personnel will exit the temporary structure by normal egress routes;
- all doors will be closed as much as possible;
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;

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- SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;
 - once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, the ventilation system will be shut down, all vents will be closed, and remaining personnel will exit the temporary structure via a non-alarming CAM vestibule or as directed by RCTs if the CAMs in both vestibules are alarming;
 - based on sample and radiological survey results, potential personal radiological exposures will be reviewed;
 - site controls and work practices will be reviewed and modified as necessary; and
 - upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.3 Equipment Radiological Contamination or Radiation Levels > RWP Suspension Limits

Should Uranium²³⁸ contamination or radiation levels greater than the suspension limits stated on the RWP be detected, the following actions will be taken:

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- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
 - the Radiological Safety Technical Supervisor will be notified;
 - all nonessential personnel will exit the temporary structure by normal egress routes;
 - all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;
 - once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure;
 - based on the survey results, site controls, and work practices will be reviewed and modified as necessary; and
 - upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.4 Personnel Radiological Contamination

Personnel will be frisked when exiting the CA/EZ. If levels > 500 dpm alpha on the instrument at the outer step-off pad are detected on personnel after the removal of personal protective equipment, or at the discretion of the Radiological Safety Technical Supervisor, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
- the Radiological Safety Technical Supervisor will be notified;
- depending on the location and level of contamination, the appropriate actions will be taken to protect the contaminated individual and personnel in the area;
- all nonessential personnel will exit the temporary structure by normal egress routes;
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure;
- based on the contamination levels, site controls and work practices will be reviewed and modified, if necessary; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.5 Confirmed Presence of Plutonium or Fissile/Enriched Uranium

Should AP-2 portable alpha analyzer, gamma/alpha spectroscopy, or laboratory analysis indicate the presence Plutonium or fissile/enriched Uranium above the action levels stated in Table 7.2, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
- RCT's not wearing respiratory protection in the RBA/CRZ will immediately exit the temporary structure;
- the Radiological Safety Technical Supervisor will be notified;
- Nuclear Safety, Criticality Safety, and Air Quality will be notified as appropriate;

- all nonessential personnel will exit the temporary structure by normal egress routes and relocate to a safe upwind assembly area (*No personnel will be allowed to leave the assembly area.*);
- the ventilation system will be shut down and all doors and vents will be closed;
- if DAC values do not exceed the protection factor of the respirators being worn, all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure;
- DAC value will be recalculated and potential personal radiological exposures will be evaluated;
- based on the level of Plutonium or fissile/enriched Uranium, site controls and work practices will be reviewed and modified as necessary; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.6 Chemical Air Monitoring > Action Levels in the RBA/CRZ or Outside the Temporary Structure

In order to protect collocated workers in the RBA/CRZ and project support zone, real-time chemical air monitoring will be conducted in those areas. Should real-time air monitoring indicate the sustained presence (approximately ten seconds) of chemicals at levels greater than the action levels for personnel without respiratory protection in the RBA/CRZ and project support zone, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and Field Supervisor will be notified;
- all personnel in the RBA/CRZ and support zone will be relocated to a safe area;
- Industrial Hygiene supervision will be notified;
- all nonessential personnel will exit the temporary structure by normal egress routes and relocate to a safe area;
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and

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- the excavator operator will inert material in the trench with non-uranium containing soil;;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure;
- based on monitoring results potential personal chemical exposures will be reviewed;
- based on monitoring results, site control and work practices will be reviewed and modified; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.7 Chemical Air Monitoring or Sample Results > IDLH Action Levels

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The exhaust system on the temporary structure is designed to maintain atmospheric chemical levels below the level which is Immediately Dangerous to Life and Health (IDLH). However, if sustained (approximately ten seconds) real-time air monitoring in the breathing zone or personal or area integrated sample results indicate chemical levels greater than the IDLH for any chemical, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and Field Supervisor will be notified;
 - Industrial Hygiene supervision will be notified;
 - all nonessential personnel will exit the temporary structure by normal egress routes;
 - if real-time air monitoring results do not exceed the protection factor of the respirators being worn, all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;
 - once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure;
 - based on air monitoring and sampling results, potential personal chemical exposures will be reviewed;
 - based on air monitoring and sampling results, work practices and engineering controls will be reviewed and modified; and
 - upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.
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Cadmium, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and Field Supervisor will be notified;
- Industrial Hygiene supervision will be notified;
- the temporary structure will be posted as a "Regulated Area" depending on the contaminant present;
- based on air sampling results, site control, work practices, training requirements, and medical surveillance will be reviewed and modified per OSHA Title 29 CFR 1910.1018 *Inorganic Arsenic* or Title 29 CFR 1910.1027 *Cadmium*, as appropriate; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.11 Encountering Unusual Debris During Excavation

Historical data indicates debris associated with Trench 1 Site is limited to waste personal protective equipment, wood, metal, rubber, plastics, fiberglass, paper, and glass. However, if an item such as a sealed canister or a compressed gas cylinder is encountered, the following actions will be taken:

- excavation activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
- the Radiological Safety Technical Supervisor will be notified;
- information regarding the debris will be gathered from a distance. This will include any labels, markings, or other visual clues as to the nature of the debris. If safe to do so, personnel will conduct radiation and contamination surveys and monitor the debris for chemical and combustible gases;
- all nonessential personnel will exit the temporary structure by normal egress routes;
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure;
- based on the information gathered radiological surveys, chemical and combustible gas monitoring results, and other characterization data, further handling of the debris will be evaluated and work practices will be reviewed and modified if necessary; and

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- Upon approval from the RMRS Environmental Restoration Director or designee, excavation activities will resume.

7.7.12 Presence of Volatile Organic Compounds in Soil

If analytical results show volatile organic compounds at levels greater than 114 parts-per-million in the soil, Air Quality Management shall be notified to determine if additional air emissions analysis and/or revisions to the Air Pollution Emission Notice will be required.

7.7.13 Breathing Air Compressor Failure

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Breathing air for the SCBAs and airline respirators will be supplied by two field located breathing air compressors. The breathing air supply systems are designed so that if both compressors fail there is an adequate supply of stored air to allow personnel to conduct a limited amount of work, place the depleted uranium in a fire-safe configuration, and egress the temporary structure. If the east vestibule compressor fails or is out of specification as stated in Operations Order No. OO-T1-05, *Use of MSA Custom 4500 II Self Contained Breathing Apparatus and PremAire™ Air Line System* and the west vestibule compressor is operational, work will be evaluated as to the amount of breathing air available to conduct normal operations. However, if the supplied airline compressor (SIP operations) fails or is out of specifications, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and Field Supervisor will be notified;
- RMRS Industrial Hygiene supervision will be notified;
- all nonessential personnel will exit the temporary structure by normal egress routes;
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.14 Electronic Personal Dosimeter Alarm Inside the Temporary Structure

Electronic Personal Dosimeters (EPDs) will be issued to selected personnel as determined by Radiological Engineering. The EPDs will track personnel exposures on a daily basis and will alarm at unexpected area

radiation dose rates greater than 2mrad/hr. If the alarm on any EPD activates , the following actions will be taken:

- the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
- the Radiological Safety Technical Supervisor will be notified;
- personnel in the temporary structure will relocate to an area of known dose rate less than 2mrad/hr;
- an RCT will respond to the alarming monitor and survey the area with an RO-20 to determine the dose rate level and locate the source of the radiation;
- if dose rates exceed the 2mrad/hr administrative limit, the source of the radiation will be controlled, if possible;
- if dose rates exceed the 5mrad/hr at 30 centimeters, the area will be posted as a "Radiation Area"
- if dose rates exceed 10mrad/hr at 30 centimeters or 300 mrad/hr beta radiation on contact, work will be suspended as stated in section 7.7.3; and
- if work is not suspended, site controls, and work practices will be reviewed and modified as necessary.